

CLAIMS

1. A respiratory monitoring system comprising:
  - a patient interface comprising a nasal cannula and a visual display, said nasal cannula comprising at least a first nasal capnography port and a first pressure sensor port and said visual display comprising indicators that are visible to a user while simultaneously observing a patient;
  - a respiratory monitor, comprising a sensor, wherein said respiratory monitor is adapted so as to be coupled to said patient interface and generate a signal reflecting at least one respiratory condition of the patient; and
  - an electronic controller interconnected with the respiratory monitor and the patient interface, wherein said visual display is modified based on the information contained in said signal.
2. The system of claim 1, further comprising a drug delivery device supplying one or more drugs to said patient, wherein said electronic controller receives said signal and manages said drug delivery device in response to said signal.
3. The system of claim 1, further comprising a user interface allowing a user to enter inputs, said inputs corresponding to thresholds for at least one respiratory parameter.
4. The system of claim 3, wherein said predetermined thresholds relate to inhalation or exhalation of said patient.
5. The system of claim 3, wherein pressure waveform analysis and segmentation is used to identify one of respiratory effort and effect based on said predetermined thresholds.
6. The system of claim 4, wherein alarm conditions are determined based on said one of respiratory effort and effect in relation to said predetermined thresholds.

7. The system of claim 4, wherein alarm conditions are determined based on other criteria in addition to said one of respiratory effort and effect in relation to said predetermined thresholds.

8. The system of claim 4, wherein said respiratory visual display comprises at least one series of light emitting diodes (LEDs) such that specific LEDs are associated with corresponding said one of respiratory effort and effect based on predetermined thresholds.

9. The system of claim 8, wherein said respiratory visual display is updated in real time.

10. The system of claim 8, wherein said LEDs are color coded to correspond to each type of said predetermined thresholds.

11. The system of claim 8, wherein said predetermined thresholds represent a gradual increase in magnitude of a corresponding parameter.

12. The system of claim 3, wherein said sensor includes at least one of a pressure sensor, humidistat, thermistor, and flow sensor.

13. The system of claim 1, further comprising an ear mount adapted for placement on at least one ear of a patient and from which said visual display can be mounted.

14. The system of claim 13, further comprising a support band coupled to said ear mount to provide stability to said ear mount and said visual display.

15. The system of claim 1, wherein said medical device is a sedation and analgesia system.

16. A method for implementing respiratory monitoring comprising:

attaching the patient interface, comprising fitting a patient with visual display and nasal cannula, wherein said visual display comprises a plurality of LED indicators indicating multiple levels of negative and positive pressure that are visible to a user while simultaneously observing a patient;

identifying a plurality of incremental thresholds for negative pressure readings and positive pressure readings;

integrating a respiratory monitoring device with said patient interface, wherein pressure variations caused by said patient's respiration pass to a sensor;

conducting a first query whether pressure sensed by said sensor is one of negative pressure and positive pressure;

if result of said first query is negative pressure, conducting a first negative pressure query to determine whether the negative pressure exceeds a first negative pressure threshold from said plurality of incremental thresholds for negative readings;

if result of said first query is positive pressure, conducting a first positive pressure query to determine whether the positive pressure exceeds a first positive pressure threshold from said plurality of incremental thresholds for positive readings;

if the result of said first negative pressure query exceeds said first negative pressure threshold or the result of said first positive pressure query exceeds said first positive pressure threshold, lighting a first pressure LED from said plurality of LED indicators corresponding to one of said first negative pressure threshold and said first positive pressure threshold; and

if the result of said first negative pressure query exceeds said first negative pressure threshold or the result of said first positive pressure query exceeds said first positive pressure threshold, conducting at least one additional negative pressure query or positive pressure query.

17. The method of claim 16, wherein said step of integrating further comprises providing a plurality of sensors in cooperation with said pressure sensor.

18. The method of claim 16, wherein said negative pressure reading or said positive pressure reading of sufficient magnitude to cross multiple of said plurality of

incremental thresholds results in simultaneous illumination of each LED corresponding to each of said crossed thresholds.

19. The method of claim 18, wherein pulse width modulation (PWM) of an electrical supply is delivered to an LED array such that, as a greater number of said plurality of incremental thresholds are crossed, the pulse width of said electrical supply is increased, resulting in brighter light intensity of the LEDs.

20. A method for employing respiratory monitoring having alarm responses, comprising:

establishing first alarm parameters comprising minimum pressure thresholds that are programmed into a ;

establishing second alarm parameters associated with a moderately critical patient state;

establishing third alarm parameters associated with a severely critical patient state;

attaching a patient interface, comprising fitting a patient with visual display and nasal cannula, wherein said visual display comprises a plurality of LED indicators;

monitoring the patient, wherein said monitoring produces data regarding said patient;

querying whether said data is outside said first alarm parameters;

if said data falls outside said first alarm parameters, generating a first alarm condition;

querying whether said data is outside said second alarm parameters;

if said data falls outside said second alarm parameters, generating a second alarm condition;

querying whether said data is outside said third alarm parameters; and

if said data falls outside said third alarm parameters, generating a third alarm condition.

21. The method of claim 20, wherein said visual display comprises a first series of LEDs, a second series of LEDs, a third series of LEDs, an inhalation LED, and an exhalation LED.

22. The method of claim 21, wherein said first, second and third series of LEDs is a color distinguishable from each other and from said inhalation LED and said exhalation LED.

23. The method of claim 22, wherein said first alarm condition comprises initiating a visual alarm via said first series of LEDs, said second alarm condition comprises initiating a visual alarm via said second series of LEDs, and said third alarm condition comprises initiating a visual alarm via said third series of LEDs.

24. The method of claim 23, wherein at least one of said first, second and third alarm condition further comprises initiating an auditory signal or alarm.

25. The method of claim 20, wherein at least one of said first, second and third alarm condition comprises initiating a step down of drug delivery rate associated with a drug delivery.

26. The method of claim 20, wherein at least one of said first, second and third alarm condition comprises deactivating one or more patient peripherals.

27. The method of claim 20, wherein at least one of said second and third alarm condition is based on a patient's respiratory rate.